REMARKS

This Amendment, in connection with the following remarks, is submitted as being fully responsive to the Office Action. Claims 1 and 3-34 are pending in the present application. Claims 1, 13 25 and 33 have been amended. Claims 20-24 have been canceled without prejudice as to subject matter or as to re-file. No new matter has been added. Claims 1, 13, 25 and 33 are the remaining independent claims. Favorable reconsideration is requested.

INTRODUCTION

Claims 20-24 stand rejected under 35 U.S.C. § 101. Applicants have canceled claims 20-24 without prejudice. Thus, this rejection should be removed.

Claims 1 and 3-34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,970,464 to Apte et al. ("Apte") in view of U.S. Patent No. 4,975,840 to DeTore et al. ("DeTore") and further in view of U.S. Patent No. 5,893,072 to Zizzamia ("Zizzamia").

Applicants respectfully submit that he claims as amended are patentably distinct from Apte, DeTore and Zizzamia, whether alone or in combination. Upon careful review of the cited art Applicants submit that although the cited art contains terminology that bears some linguistic and lexical similarity with the claimed invention, Applicants cannot stress enough the fact that a careful analysis of the (admittedly difficult) subject matter would disclose no semantic similarity with, and no teaching of, the claimed invention, whether alone or in any combination.

The prior art describes technology at least two generations prior to that of the claimed invention. Such older methodology is rule-based, where the rules are generated a prior by humans, and wholly in abstract of any other predictive variables. Rules are not

mathematically simultaneously generated, as in modern systems which solve a large set of simultaneous conditions. The cited art thus simply does not teach or describe the highly granular, automatically generated individual policy scoring algorithm generated from a multivariate statistical model of the claimed invention, where the variables comprising and the model itself is automatically derived form the totality of the data as opposed to being "figured out" and then "modified" by "experts" or "underwriters." Any similarity between the cited art and the claimed invention is superficial and lexical, and not substantive or semantic.

Citing to DeTore at 14:23-44, as was done in the Office action, for "suggestions as to any additional information" simply is a complete reach! This language is abstract, and the Office Action does not quantify or supply any details as to what the Examiner believes it actually reaches. It definitely does not teach the claimed invention! DeTore is a human created system, and "any additional factors" are not new synthetic variables generated from the available data, and then used as predictive variables whose various co-efficients are simultaneously arrived at with those of all the other predictive variables.

Applicants feel it necessary to stress that this application has now seen its fourth Examiner. Thus, no single Examiner has been with this case long enough to issue an office action and then remain involved to review Applicants' subsequent response and react to it. That is highly disheartening. Moreover, Applicants believe, this state of affairs has caused unnecessary delays due to each respective examiner's learning curve, which is then wasted as soon as he or she moves on. It has also created a copy and paste approach to office actions in this case, which Applicants do not see as providing them the full and legitimate examination to which they are entitled. Applicants thus respectfully request a careful review of this response (and not a cut and paste of rejections from earlier Office Actions), and an opportunity to hold a

personal interview with the examiner and his supervisor to discuss any open issues once that is accomplished, as requested formally below.

35 U.S.C. §103(a) REJECTIONS

The Claimed Invention

A noteworthy feature of the method of claim 1, as amended, is the generation of a score based on the independently weighted statistical model based upon the set of predictive variables. These include derived or synthetic variables. Moreover, the score is expressed as a sum of products, each of said products being a coefficient multiplied by a variable taken to a power (the described y-intercept would be a variable taken to a power of 0, and thus be unity). These co-efficients are generated by operating on the set of predictive variables in a mathematically simultaneous manner. As described in the specification, although external data sources offer one of the best opportunities to obtain the characteristics of a business and/or the practices of an owner of the business property to be insured, commercial insurance companies' use of such data to supplement their conventional pricing methods has been at best haphazard, inconsistent, and non-systematic. *Specification* at ¶ [0009].

According to a described exemplary embodiment, after collection, such external data can, for example, be culled to eliminate highly repetitive predictor variables (*i.e.*, create a more or less orthogonal variable set), and the remaining variables can, for example, be included in an automatically generated multivariate statistical model. *Specification* at ¶¶ [0083-0089]. Additionally, new variables can be created form the available data. Such new variables are combinations of or derived from external variables obtained from the external data sources, and these "synthetic" variables can be included in the variable set form which the statistical model is generated. Once the predictive variables are obtained (*i.e.*, both external variables and created or

derived new "synthetic" variables), ***each predictor variable can, for example, be assigned a separate co-efficient.*** *Id.* at ¶¶ 86-87. Thus, the present invention is a data driven approach, obtained by mining the data as a whole, where (i) identification of external predictor variables and predictive new variables, and (ii) the weights to be assigned them, are automatically generated from a statistical analysis operating on large amounts of historical data obtained form a variety of sources, as described above. *Id.* at ¶¶ 70-89. The statistical analysis automatically determines the optimal weighting of such predictor variables:

> The development process of the predictive statistical model generates the mathematical formula's coefficients. One example of the form of such a simplified equation might be as follows: a0+a1x1+a2x2+ . . . aNxN = y. In this example, the "a's" are the coefficients, the "x's" are the individual predictor variables, and "y" is the score, i.e., the indication of commercial insurance profitability. The "a0" is the mathematical "y-intercept".

Id. at ¶ 86.

In the Office Action, at page 5, item 16(i), DeTore is cited as teaching:

> i. creating a score based on an individually weighted multivariate statistical model based on said individual external predictive variables, wherein said evaluating external variables includes evaluating the utility of creating new variables from the external variables.

DeTore is directed to a 1980s vintage artificial intelligence ("AI") system, of the expert system type. As such, it seeks to use the accumulated knowledge of ***human experts*** to evaluate the risk of a proposed insurance policy and thus make underwriting decisions. "Underwriting knowledge base 24 is the information base that drives the system." DeTore at 4:54-55. The knowledge base incorporates the information contained in the underwriting manuals used by the assignee of DeTore (i.e., Lincoln Naitonal Risk Management, Inc.) , as well

as factual elements and programmed knowledge in the form of expert modules. *Id.* at 4:55-5:3. DeTore is designed to allow non-expert underwriters to underwrite potential insurance business. They do this by accessing the expert system.

In similar fashion to Apte, DeTore describes a qualitative, rule driven approach, which uses various rules to match identified "problems" from the application data base to a corresponding "impairment" from the underwriting database, and then assigns weights (debits or credits) to the identified problems based upon information (*i.e.*, other rules) in the underwriting database. A problem is not an external datum or even related to external data! A problem is defined by DeTore as follows:

> For purposes of this discussion, the term "problem" will generally mean an element of information (e.g., facts and conditions such as age, a medical condition, a hazardous avocation, a smoking or drinking habit, etc.) stored in application data base 20 which impacts either positively or negatively upon the relative mortality of the proposed insured. The term "impairment" will generally mean an element of information (e.g., the impacts of aging, various medical conditions, avocations, smoking, drinking, etc. on the mortality of known populations) stored in underwriting knowledge base 24 which relates to or corresponds with the information contained in application data base 20. Each impairment is associated with textual information and/or an expert system or module which is intended to assist the system operator in quantifying the impact of a particular problem (by reference to a corresponding impairment) upon expected mortality in a particular instance.
>
> DeTore at 5:40-57.

Once the weights have been ***assigned by human experts*** to the identified problems (again, not any external data, and again "assigned" not evolved or simultaneously generated using a multivariate model), they are then combined to generate a risk classification for the proposed insurance. DeTore at 5:40 – 6:2. This assignment of weights is not by a machine running some multivariate statistical analysis algorithm ***on all the predictive variables in the set*** to find the best weighting for a set of variables, as in the claimed invention. Quite the

contrary. In DeTore, any contribution from a "problem" is determined *a priori*, by an expert module. If there is no expert module available for a given "problem" the problem is normally left "unresolved" unless the underwriter (now an actual human) is himself an "expert" in the subject area of concern. *Id.* at 15:20-34. ***At no time is external data mined to identify predictor variables and then further processed to assign weights consistent with the data given a statistical analysis. At no time are new variables created from external variables, or is the utility of such creation evaluated.*** All DeTore teaches is assigning weights to internal problems – information stored in the application database, i.e., provided by an applicant for insurance -- *a priroi*, using expert modules or, where no expert module is available, using a human expert acting "on the fly." *Id.*

DeTore does not teach automatic creation of a multivariate statistical model, or teach generating a score based thereon. DeTore wholly ignores the issue of creating new variables from external data sources, *i.e.*, "synthetic" variable creation. Creation of a synthetic variable is not "adjusting one or more of the weights assigned to selected problems on the basis of previously stored statistical profiles relating to the selected problems." (DeTore at 15:42-65) as cited by the Office Action at 5, nor is it some human utilizing "suggestions as to any additional information that should be obtained to adequately underwrite the case" (DeTore at 14:23-44). This latter terminology is vague, and is speaking about human action. What is "any additional information that should be obtained"? Should? According to which criteria?

There is simply no teaching of the claimed invention in DeTore.

Creation of a synthetic or new variable is exactly what it says. For example, the data found in insurance policy databases contains the home residence of the insured as well as

the name of the brokerage through which the insurance policy was sold. The inventors have found that the greater the distance between these points, the greater the losses by an insured on said policy. That is not some "suggested additional information" that is a statistically significant derived variable, obtained by statistical analysis, and weighted with all other variables, both natural and synthetic, simultaneously, to arrive at optimally predictive co-efficients.

The cited section of DeTore has nothing to do with synthetic variables or simultaneously solving for all co-efficients, including those for the synthetic variables.. It simply is human experts adjusting the weights already assigned by humans.

Thus, DeTore is not seen by Applicants as teaching the claimed

--creating one or more derived variables from at least one of said external variables and said policyholder data;

--evaluating the associated external variables **and the derived variables against the policyholder data to identify a set of variables predictive of the insurance policy's profitability** and creating a score based on an individually weighted multivariate statistical model based on said set of predictive variables, ***and***

---wherein said score is expressed as a sum of products, each of said products being a coefficient multiplied by a variable taken to a power, **said coefficients generated by operating on said set of predictive variables mathematically simultaneously**

Applicants respectfully assert that Apte and DeTore, even when combined, do not teach all of the recited features of the independent claims.

Any combination of these references with Zizzamia also fails. Zizzamia is directed to predicting accurate loss ratios for personal lines insurance products, not to

predictively scoring commercial policies of insurance as to profitability. Zizzamia does not cure the deficiencies of Apte or DeTore as a reference against the claimed invention. Zizzamia's sole reference to a multivariate statistical model is the following:

> The predicter 32 must produce a predicted loss ratio given a set of classification plan variable values. Multivariate statistical modeling curve fitting techniques provide a method for creating such a predicter. Curve fitting techniques generate a correspondence between prescribed sets of inputs and outputs. One such technique is multiple regression, described in "Intermediate Business Statistics: Analysis of Variance, Regression and Time Series" by Robert Miller and Dean Wichern, incorporated herein by reference.
>
> However, in the preferred embodiment, the loss control system 8 employs neural network modeling algorithms executed on computational hardware to generate signals indicative of the predictive apparatus 12. A neural network is a nonlinear general purpose function approximator which is trained to learn an unknown function based on known inputs and corresponding outputs. Once the neural network learns the unknown function, the neural network is able to generate outputs for other sets of inputs, even input patterns to which the network was never exposed. Neural network topologies and training techniques, specifically those used in the preferred embodiment as disclosed hereinafter, are described in "Neural Networks: A Comprehensive Foundation" by Simon Haykin, also incorporated herein by reference.
>
> Zizzamia at 9:18-42.

Zizzamia obviously advises against using multivariate statistical modeling curve fitting techniques, and endorses the use of neural networks. Because Zizzamia is directed to personal lines insurance products, which require that an insurer list all of the underwriting factors it uses, Zizzamia does not, and could not, teach a machine running software that automatically creates new variables from the available data and then assigns weights to those new synthetic variables. It is simply impossible, given the regulatory regimes of government insurance overseers, to add any data driven predictive variables after a given insurer's set of factors has been filed with a state regulatory agency. Moreover, Zizzamia does not describe generation of any score from an individually weighted multivariate statistical model, and also fails to describe

that said score be a function of at least all of the predictive external variables and any predictive new variables. Finally, Zizzamia fails to describe a score expressed as a sum of products, each of said products being a coefficient multiplied by a variable taken to a power.

In contrast, the claimed invention, inasmuch as it is applicable to commercial lines, involves a gamut of variables that are neither disclosed nor included on any insurance regulatory rating classification plans on file with State Insurance Departments. The reference to the use of a multivariate statistical model in Zizzamia is limited to the adjustment of the absolute value of already disclosed factors in such regulatory rating classification plans for the sole and expressed purpose of optimizing such disclosed factors' values.

Applicants have raised this distinction on the record. The Office Action, as in prior Office Actions, glides over Applicants' prior arguments in this regard. One cannot simply assert that a rule based system such as is described in Apte – which, Applicants have analyzed and demonstrated at length, can be combined with an expert based (also human, also a priori) system such as DeTore, to teach all of the elements of the claimed invention. The claimed invention recites automatically data mining the variables to find a multivariate statistical model, not a human or humans creating set of rules independently from each other, which are not simultaneously derived so as to be optimally tuned.

The claimed automatically generated statistical model does not comprise adding together a set of separately generated rules into a single expression. The claimed automatically generated statistical model is generated by automatically using various trial weightings of all of the variables, including any synthetic variables automatically generated (unlike, and impossible,

in Zizzamia), to find an optimal predictive weighting. The contribution of each variable **in combination** with all other variables is **always** considered.

For at least these reasons, amended claim 1 is asserted as patentably distinguished over Apte, DeTore and Zizzamia, whether taken alone or in any combination.

The remaining independent claims, claims 13, 25 and 33, recite similar features as does claim 1, and are thus also urged as patentable over Apte, DeTore and Zizzamia, whether alone or in any combination, for similar reasons. The dependent claims are thus also urged as patentable for similar reasons.

No additional fees are believed due herewith. If any additional fees are due, the Commissioner is hereby authorized to charge any fee deemed necessary for the entry of this Amendment to Deposit Account No. 50-0540.

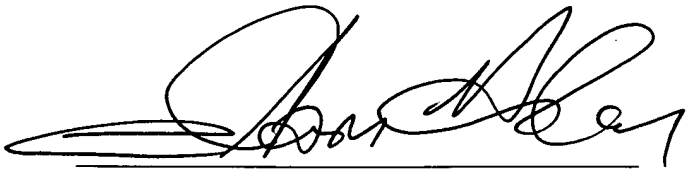
REQUEST FOR PERSONAL INTERVIEW

As is obvious from the filing date, this case has been pending for some time. Now another new Examiner has been assigned, and the Applicants feel that they have to start all over. Applicants therefore respectfully request the opportunity to hold a personal interview with Examiner Vyas and with his supervisor, Examiner Kalinowski to make sure their position is understood, and why they feel the claims as amended are patentably distinguished over the cited

art, which has not changed in quite a while. Applicants are happy to file a Supplemental Amendment as a result of said interview, and hopefully pass this application to issue.

Dated: **June 23, 2011.**

Respectfully submitted,



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